


Alundum
Safety Terrazzo

*Slip-Proof, Durable,
Quiet and Economical*


Norton Company
Worcester, Mass., U.S.A.

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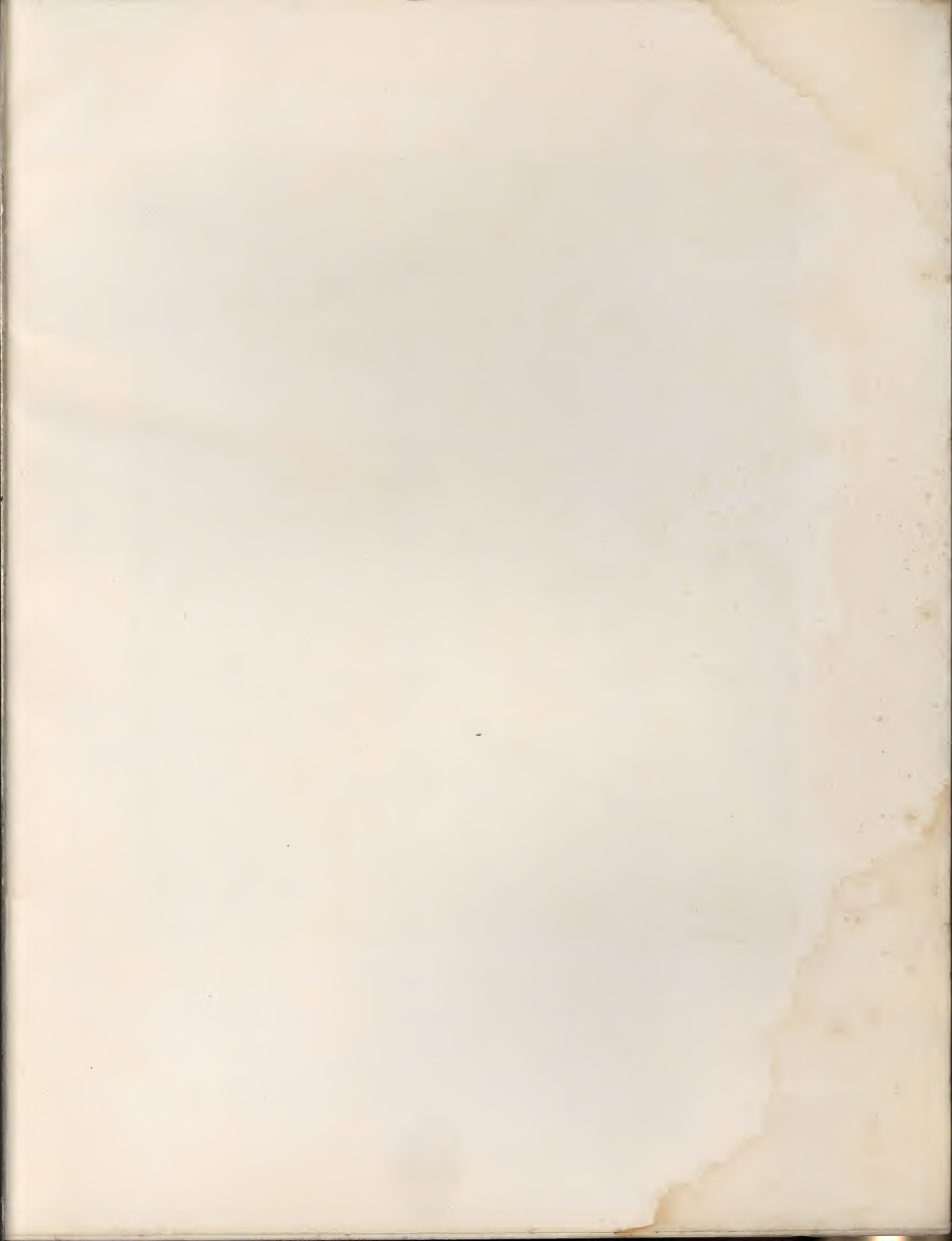
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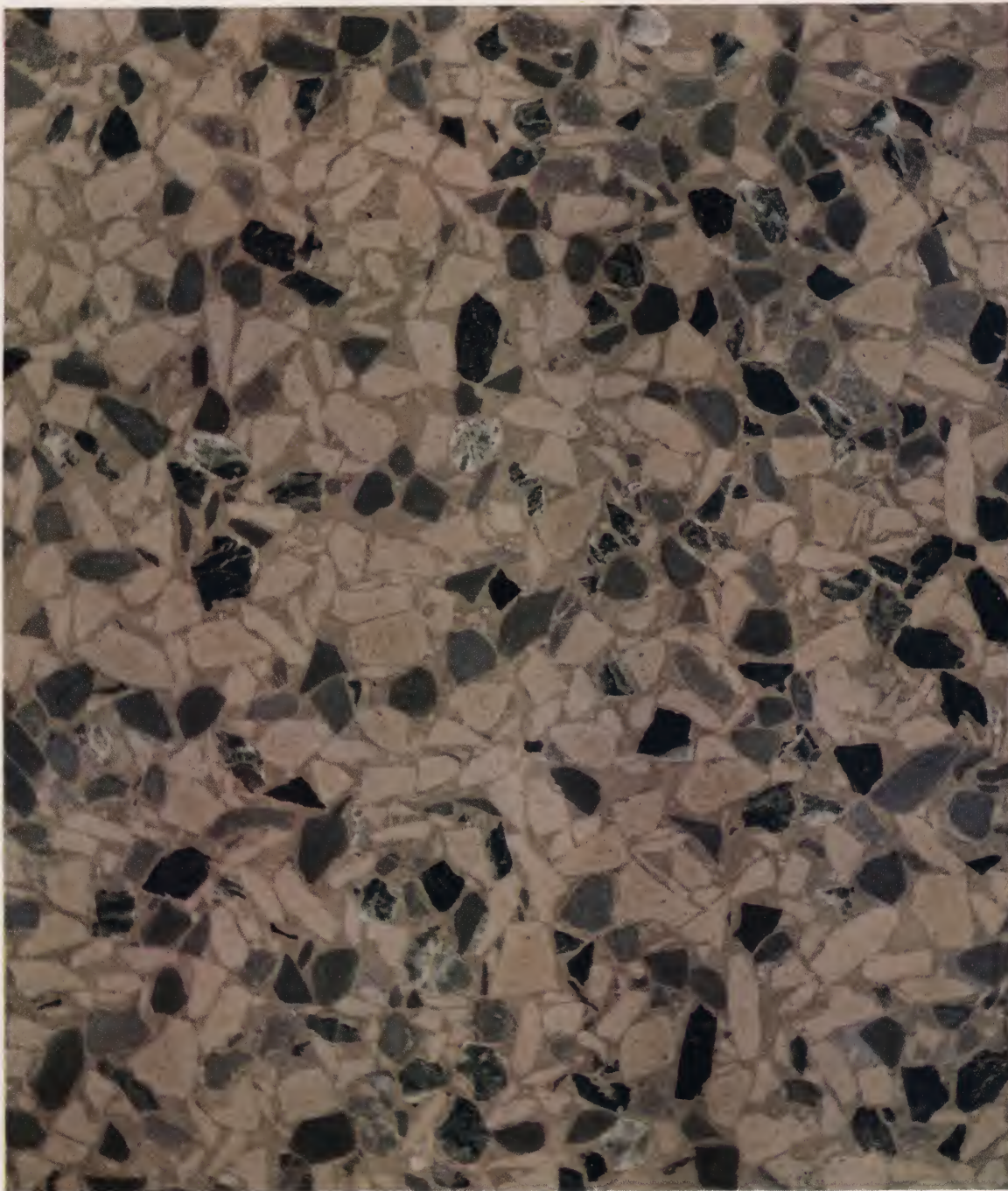
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One of the many possible terrazzo color combinations by using a mixture of Alundum Safety Aggregates and Marble Chips. This specimen floor was made of equal proportions of Green Cardiff Marble and Buff Alundum Safety Aggregates.

With the several colors of marble and safety aggregates a wide range of color combinations is available.

Alundum Safety Terrazzo

Slip-Proof, Durable, Quiet and Economical

Made with

*Alundum Safety Aggregates
and Marble Chips*



Norton Company, Worcester, Massachusetts

Manufacturers of Grinding Wheels and Grinding Machinery, Abrasive Products of various kinds, Refractory Ware
Alundum Safety Tile and Alundum Safety Aggregates

Manufacturing Plants at Worcester, Massachusetts; Hamilton, Ontario; La Courneuve, France
Wesseling, Germany; Hiroshima, Japan

Electric Furnace Plants at Niagara Falls, N. Y.; Chippawa, Ontario, Canada

New York
151 Chambers Street

Chicago
11 North Jefferson Street

Detroit
233 West Congress Street

Alundum Safety Tile, Stair Treads, Terrazzo Aggregates
and Floors are covered by the following U. S. Patents:

No. 1292953	January 28, 1919
1371683	March 15, 1921
1371684	March 15, 1921
1374136	April 5, 1921
1377957	May 10, 1921
1377960	May 10, 1921
1402296	January 3, 1921

Patented in foreign countries
Patents Pending

FORM 13-1-22-7M

The Commonwealth Press
Worcester and Boston

Alundum Safety Terrazzo

*A Floor That Remains Slip-
proof During Its Entire Life*

Terrazzo Floors are made permanently slip-proof by combining Alundum Safety Aggregates with marble chips. The durability is greatly increased without detriment to architectural attractiveness. With the variety of marble chips and the different colors of Alundum Safety Aggregates available the architect has a wide range of beautiful and harmonious color combinations. A pleasing warmth of tone results from blending the colors of the Alundum Safety Aggregates with the marble chips.

The equipment used and the method of construction employed are practically the same as for ordinary marble terrazzo floors.

In the finishing, a high polish is neither desirable nor necessary. With the proper blocks in the surfacing machine, it requires no more effort than when only marble chips are used.

The result is a floor that has all the desirable qualities of marble terrazzo with added advantages. The matt glaze slip-proof surface eliminates the slipping hazard. Walking is made secure and quiet—the aggregates lack the resonance common to tile and marble.

Alundum Safety Aggregates make this type of floor practical for ramps and stairways in railroad terminals, subway stations, hotels, hospitals, schools, public buildings and industrial plants.

Alundum Safety Aggregates

What They Are—How Produced

Modern electric furnaces operated by the great hydraulic power plants at Niagara Falls are producing materials used chiefly in the abrasive industry that are far superior for the purpose to the minerals found in nature.

Alundum Abrasive, an electric furnace product, has been a vital factor in the metal industries for many years—in the form of grinding wheels, sharpening stones, polishing grain and refractories. It has had a test for non-wearing quality that leaves no doubt as to its practicability for use as a floor material.

The Alundum Abrasive comes from the electric furnace in the form of large ingots or pigs. It goes through a crushing process which reduces it to grain form after which it is carefully screened to uniform sizes for commercial use.

To produce Alundum Safety Aggregates correct proportions of various sizes of Alundum grain are mixed with specially prepared clays and then baked in high temperature kilns. The process is similar to that by which vitrified grinding wheels and other abrasive products are produced.

They are not a by-product, but are especially made of carefully selected materials scientifically mixed and bonded so as to insure uniformity of color, texture and degree of hardness which are essential to attractiveness and durability in a floor.

Thus we have not a grain or chip of the abrasive, but many small particles of abrasive scientifically bonded together in an aggregate that is homogeneous throughout.

An Enlarged Field for Terrazzo Floors

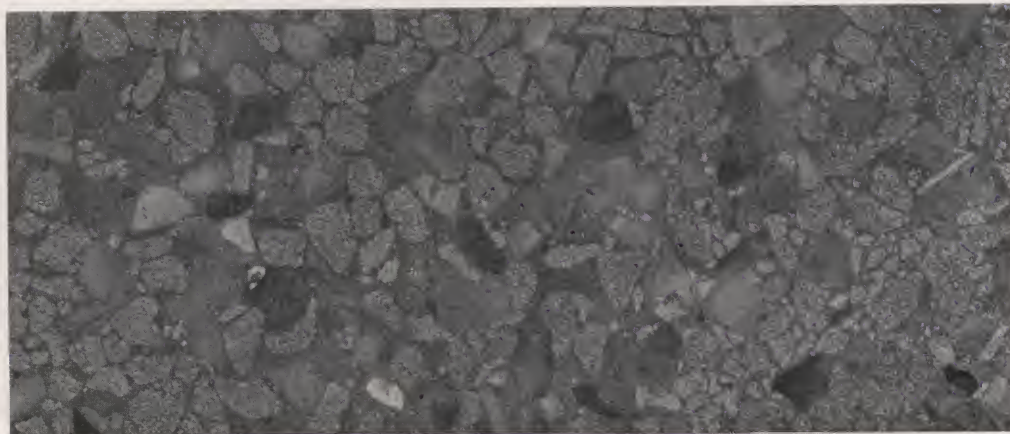
Terrazzo floors are valued for the range of color combinations that makes possible distinct originality and individuality of each effect. They are durable, sanitary and economical.

However, the highly glazed surface of the marble terrazzo has limited its use. Architects, corporations and owners now recognize the economical necessity for safeguarding the walking public against slipping and tripping accidents.

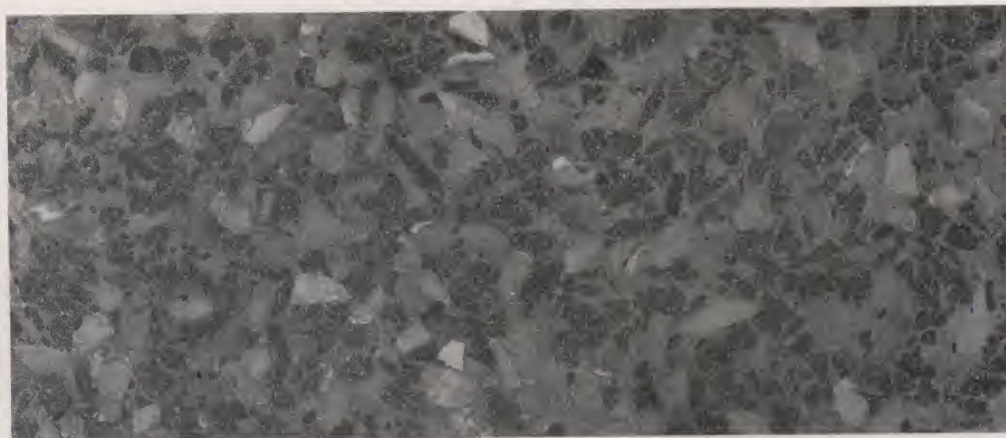
The introduction of Alundum Safety Aggregates in terrazzo floors has greatly enlarged their field of practicability. Safety is an added advantage and a vital one. It makes terrazzo an ideal floor for hotels, hospitals, office and public buildings, subway stations and railroad stations. It makes a suitable floor for ramps, entrances, lobbies and corridors, in fact, wherever it is desirable to have an unglazed, slip-proof floor that will stand severe service. It is recommended for cafes, barber shops, hospital operating rooms, hotel kitchens, wash rooms, elevator landings and bath rooms.

With the terrazzo floor makers' experience in the use of the many colors of marble chips, the selection of suitable colors and sizes of Alundum Safety Aggregates for a floor suitable to the requirements is not difficult.

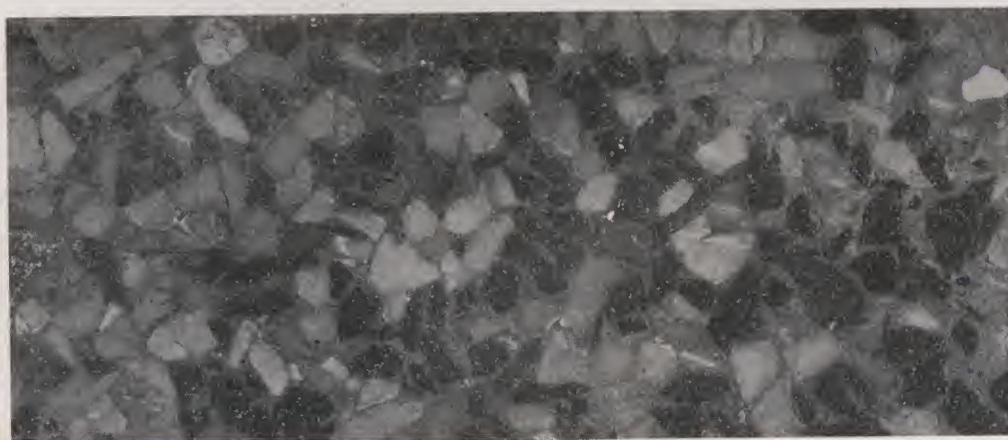
Alundum Safety Terrazzo



Yellow Verona Marble and Buff Alundum Aggregates—No. 2

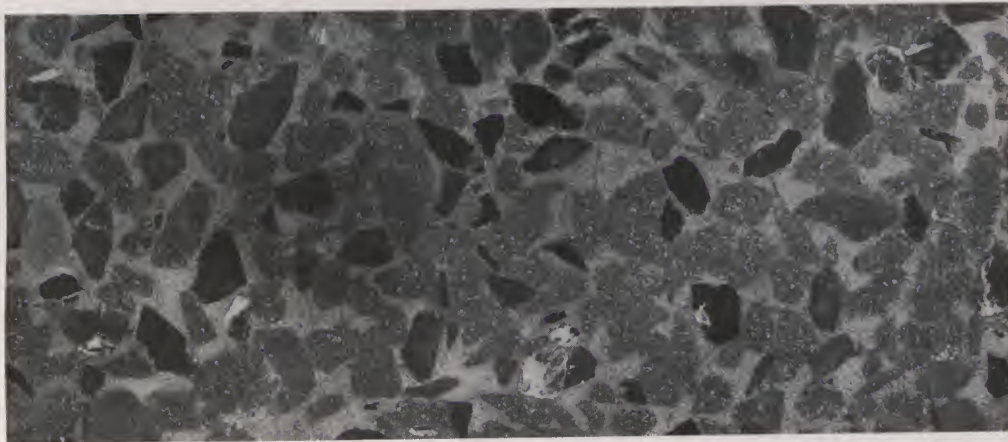


Red Verona Marble and Brown Alundum Aggregates—No. 1

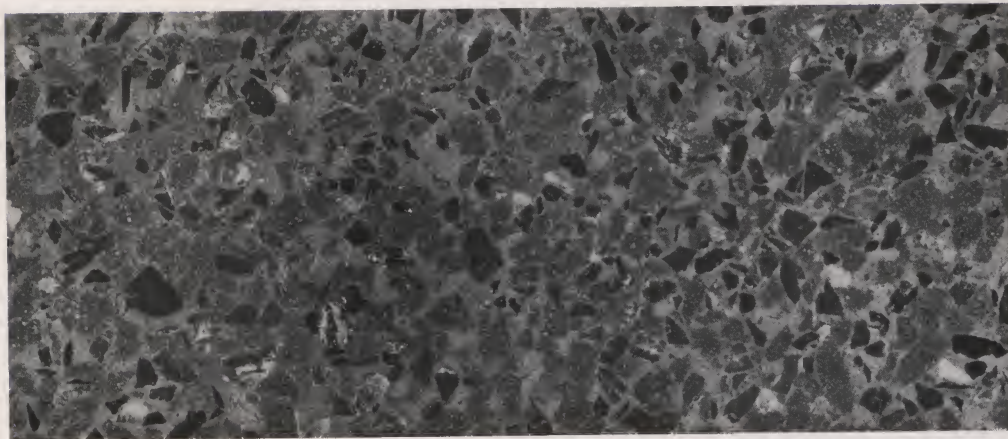


Red Verona Marble and Brown Alundum Aggregates—No. 2

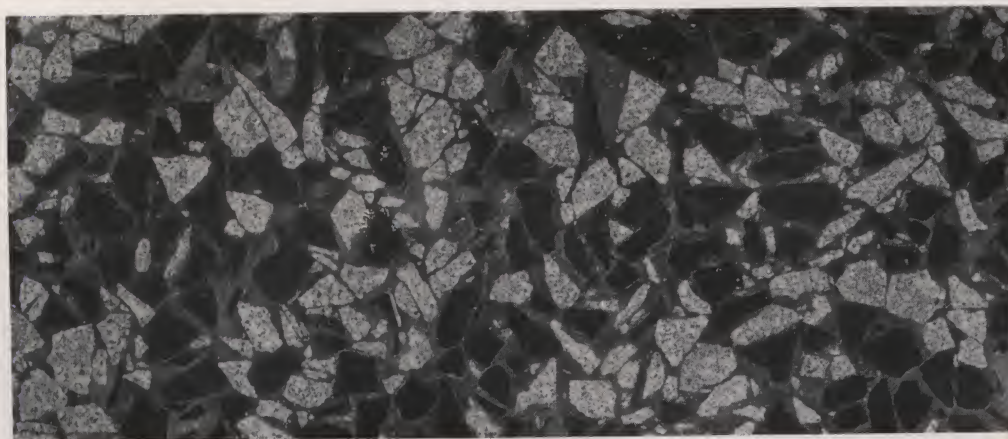
Alundum Safety Terrazzo



Green Cardiff Marble and Brown Alundum Aggregates—No. 2



Green Cardiff Marble and Brown Alundum Aggregates—No. 1



Belgian Black Marble and Buff Alundum Aggregates—No. 2

Colors And Sizes

Alundum Safety Aggregates are furnished in three colors: Brown, Buff, and Gray.

Three sizes:

No. 1	.	.	Approximately	$\frac{1}{8}"$	to	$\frac{1}{4}"$
No. 2	.	.	"	$\frac{1}{4}"$	to	$\frac{3}{8}"$
No. 3	.	.	"	$\frac{3}{8}"$	to	$\frac{1}{2}"$

Numbers 1 and 2 are recommended for general use, and number 3 for floors that are subjected to severe service, such as trucking.

It is not necessary that Alundum Safety Aggregates be used exclusively in order to obtain a slip-proof terrazzo floor.

As indicated by the following specifications a mixture of equal proportions of marble chips and Alundum Safety Aggregates gives satisfactory results.

Where floors are subjected to trucking or other severe service and durability is a vital consideration, the large size safety aggregates only should be used, mixed in the proportion of 75% No. 3 and 25% No. 2.

Resistance to Wear Test of Terrazzo Floorings

The following data indicate the wear resistance of Alundum Safety Terrazzo as compared with marble terrazzo.

These values were obtained in a test conducted upon a rubbing bed using Alundum grain as the abrading medium. The test continued for three hours and was so conducted that each specimen received exactly the same treatment. The terrazzo samples were all made in the same manner and cured under the same conditions, hence the figures should be truly comparative.

The specimens used were 6" square and each was loaded so that the effective load per tile was nine pounds. The figures given in the table below represent the wear in inches of thickness. These clearly show the superiority of the Alundum aggregate over marble terrazzo. Combination of the Alundum aggregates with marble increases quite markedly the wear resistance of terrazzo as shown by column two.

Period of test	Terrazzo with 100% brown Alundum Aggregate	Terrazzo with 50% brown Alundum Aggregate—50% marble chips	Terrazzo with 100% marble chips
1st 30 minute period	.05"	.06"	.15"
2nd 30 minute period	.04	.06	.14
3rd 30 minute period	.05	.06	.15
4th 30 minute period	.05	.06	.13
5th 30 minute period	.05	.06	.14
6th 30 minute period	.04	.06	.13
Total wear	.28	.36	.84

All aggregates were No. 2.

Marble Terrazzo test block was made of Red Verona and Cardiff Green.

The marble chips in the Alundum-Marble combination were Belgian Black.

Specifications for the Proper Installation of Alundum Safety Terrazzo Floors

Specification "A"

FOUNDATION

1. A good foundation is always essential for the construction of any terrazzo floor.
2. It shall preferably be made of concrete, composed of one part Portland cement, two parts clean, sharp sand and four parts gravel.
3. It shall be level and free from appreciable spring or vibration.

MATERIALS

CEMENT

1. The cement shall meet the requirements of the current standard specifications for Portland cement, adopted by the American Society for Testing Materials.
2. It must be suitably stored to meet these specifications when used.

SAND

1. Shall be sharp and consist of a mixture uniformly graded from coarse to fine grains and of such size that 100% shall pass a $\frac{1}{4}$ " mesh screen.
2. Shall be clean and free from clay, loam, mud, sticks, organic matter or other impurities.
3. Shall not contain more than 5% by volume of silt as measured by shaking a sample with water in a test tube and allowing it to settle.

FINE GRAVEL

1. Shall consist of clean, hard, tough, crushed rock or pebbles, free from vegetable or other organic matter and shall contain no soft, flat or elongated particles.
2. It shall pass when dry, a screen having $\frac{5}{8}$ " openings and not more than 10% shall pass a screen having 4 meshes per linear inch.

MARBLE AGGREGATES

1. Shall be from first quality marble, uniform in color, free from dust or impurities and sized within the limits as follows:

Size No. 1—Shall be such that 100% will pass a screen having 4 meshes per linear inch and not less than 90% will be retained upon a screen having ten meshes per linear inch.

Size No. 2—Shall be such that 100% will pass a screen having $\frac{3}{8}$ " openings and not less than 90% will be retained upon a screen having eight meshes per linear inch.

Size No. 3—Shall be such that 100% will pass a screen having $\frac{1}{2}$ " openings and not less than 90% will be retained upon a screen having four meshes per linear inch.

ALUNDUM SAFETY AGGREGATES

1. Shall be made in accordance with the latest improved methods in use by the Norton Company, uniform in color and grade of hardness and sized in accordance therewith.
2. The sizes covered by this specification shall include No. 1, No. 2 and No. 3.

BASE COURSE

OVER A CONCRETE FOUNDATION

1. Shall be composed of one part Portland cement, one part sand and two parts fine gravel.
2. Shall be not less than $1\frac{1}{2}$ " in thickness.
3. Shall be mixed to a consistency that will allow tamping firmly into place and shall be screeded to a level surface $\frac{5}{8}$ " below the desired level of the finished floor.
4. Shall be allowed to harden just long enough to permit walking on the surface without leaving footprints before applying the finished course as hereinafter specified.

OVER A WOODEN FOUNDATION

1. Shall be composed of one part Portland cement, one part sand and two parts fine gravel.
2. Shall be not less than 2" in thickness.
3. Shall be mixed to a consistency of thin mortar and reinforced over the entire area with a light, wire mesh or expanded metal.
4. Shall be screeded to a level surface $\frac{5}{8}$ " below the desired level of the finished floor.
5. Shall be allowed to harden just long enough to permit walking on the surface without leaving footprints before applying the finished course as hereinafter specified.
6. Over the wooden foundation, apply one layer of two-ply tarred felt laid with lap joints and nailed into place.

FINISH COURSE

GENERAL

1. For an entirely satisfactory, non-slip floor, it is not necessary to use 100% of Alundum Aggregates.
2. Excellent results can be obtained in the appearance of the type of floor herein specified, by the mixture of any of the various colored marbles available with Alundum Safety Aggregate and will satisfy the most stringent requirements of the best architects.
3. The proportions as given hereinafter, if properly adhered to, will produce a floor with satisfactory non-slip qualities, uniform in texture and with aggregates covering a high percentage of the surface. The quantity of aggregates required will be approximately 3 pounds per square foot of Alundum Safety Aggregates and 3 pounds per square foot of marble aggregates.

FINE MIX PROPORTIONS

1. Shall be composed, either by volume or weight, of:
 - 2 Parts Portland Cement
 - 3 " No. 1 Alundum Safety Aggregate
 - 3 " No. 1 Marble Aggregate

MEDIUM MIX PROPORTIONS

1. Shall be composed, either by volume or weight, of:
 - 8 Parts Portland Cement
 - 3 " No. 1 Alundum Safety Aggregate
 - 9 " No. 2 " " "
 - 3 " No. 1 Marble Aggregate
 - 9 " No. 2 " " "

COARSE MIX PROPORTIONS

1. Shall be composed, either by volume or weight, of:
 - 8 Parts Portland Cement
 - 3 " No. 2 Alundum Safety Aggregate
 - 9 " No. 3 " " "
 - 3 " No. 2 Marble Aggregate
 - 9 " No. 3 " " "

4. A floor constructed as above is the type we recommend. The proportions given below, however, while they produce a floor less satisfactory as regards non-slip qualities and less uniform in texture it will be more durable and less hazardous than an ordinary terrazzo floor and can be used in places where the service is not severe. The quantity of aggregates required will be approximately two pounds per square foot of Alundum Safety Aggregates and four pounds per square foot of marble aggregates.

FINE MIX PROPORTIONS

1. Shall be composed, either by volume or weight, of:
 - 1 Part Portland Cement
 - 1 " No. 1 Alundum Safety Aggregate
 - 2 " No. 1 Marble Aggregate

MEDIUM MIX PROPORTIONS

1. Shall be composed, either by volume or weight, of:
 - 4 Parts Portland Cement
 - 1 " No. 1 Alundum Safety Aggregate
 - 3 " No. 2 " " "
 - 2 " No. 1 Marble Aggregate
 - 6 " No. 2 " " "

COARSE MIX PROPORTIONS

1. Shall be composed, either by volume or weight, of:
 - 4 Parts Portland Cement
 - 1 " No. 2 Alundum Safety Aggregate
 - 3 " No. 3 " " "
 - 2 " No. 2 Marble Aggregate
 - 6 " No. 3 " " "

MIXING

1. Measure out the aggregates, both Alundum Safety and marble, and soak for not less than 15 minutes in clean water.
2. Drain for five or ten minutes and spread out on the mixing floor.
3. Sprinkle the cement over the aggregates and thoroughly turn and mix, breaking down all the lumps that may thus occur in the cement.
4. Add as much water to this mixture as it will hold without running out onto the floor and continue mixing and turning until the whole mass becomes homogeneous throughout.

PLACING

1. Deposit the mixture over the floor in layers, tamping with a shovel until built up about $\frac{1}{4}$ " above the finished surface desired.
2. With a roller as usually required for an ordinary terrazzo floor, kept wet, roll and re-roll the surface, compacting the mass as much as possible.
(Note:—This process is all important and cannot be overdone. Care must be taken to keep the roll wet that it will not pick up the particles of aggregate and thereby spoil the texture of the surface.)
3. Spread over the surface, taking care not to dislodge the aggregates, a grout composed of Portland cement and clean water mixed to a creamy consistency and roll until no further impression on the surface can be made.

FINISHING

GENERAL

1. Due to the slip-proof qualities of the Alundum Safety Aggregates, it is necessary to wait a longer time than is usually required, for the ordinary marble terrazzo floor, after placing the finished course before rubbing or finishing operations can begin.
2. On account of variable weather conditions, it is impossible to specify the exact length of time required, but in all cases, it should be long enough so that the Alundum Safety Aggregates will not be pulled out of the surface by the rubbing action.

RUBBING

1. With a rigid surfacing machine as ordinarily used for any terrazzo floor equipped with vitrified blocks of Crystolon manufactured by the Norton Company, rub the entire surface level, removing about $\frac{1}{16}$ " or as much as will be necessary to display the aggregates uniform in size and densely packed. Use an abundance of clean water during this process.

2. Smooth up in a similar manner, using vitrified brick of a finer grain of Crystolon.

(Note:—A good deal of the rubbing required to polish the ordinary terrazzo floor can be done away with on a floor of this kind, it being only essential to bring the aggregates to a uniform texture and obtain a level surface.)

GROUTING

1. If after the above operation, blow holes appear in the surface, proceed as follows:
2. Cover the entire surface with a fairly thick grout composed of Portland cement and clean water, filling the pores and blow holes and allow to dry until the grout becomes a pasty stiffness.
3. With a smooth, wooden float or block, rub the cement into the blow holes and off the surface and allow it to set before final rubbing.

FINISH RUBBING

1. With a surfacing machine, as previously specified, go over the surface until the cement is entirely removed therefrom, using vitrified blocks of Crystolon.

TREATING

GENERAL

Due to the fact that a high polish is both undesirable and unnecessary for a floor of this kind, a flatness in color will be evident after the finish rubbing, but can be overcome by the following treatment, if desired.

1. After the surface has become thoroughly dry, apply with a wide paint brush, a coat of any *light oil*.
2. After a period of between one and two hours, using a clean unbleached cotton rag, rub the entire surface absolutely dry of oil.
3. If an unevenness in this treatment is apparent, additional applications as above specified will overcome the difficulty, although usually not more than two are required.

Slip-proof Surface For Cement Sidewalks

Specification "B"

1. Prepare the top surface, composed of one part Portland cement and two parts clean, sharp sand, in the usual manner and screed to a level surface.
2. Soak No. 2 or No. 3 Norton Alundum Terrazzo Aggregate in clean water, not less than 15 minutes, and drain for five or ten minutes.
3. Sprinkle the entire area uniformly with the aggregates, using about $\frac{1}{2}$ pound per square foot of surface.
4. Tamp the aggregates flush with the surface, using a wooden float, taking care not to bury the chips.
5. Float and trowel in the usual manner.
6. A slight rubbing with an abrasive brick and water will expose the chips.



